

Comparative Study of Morbidity and Mortality of Non H1N1 Pneumonia with H1N1 Pneumonia in Gandhi Hospital during the Epidemic of H1N1 Outbreak

NL Varun Mai¹, Mudumala Issac Abhilash², Narasimhulu³

ABSTRACT

Introduction: WHO raised a pandemic alert for H1N1 influenza infection as “public health emergency of international concern” in April 2009. In this study at Gandhi Hospital, we compared the morbidity and mortality of Non-H1N1 pneumonia with H1N1 pneumonia during this epidemic of H1N1 influenza. Current study aimed to compare morbidity and mortality of Non-H1N1 pneumonia with H1N1 pneumonia during the epidemic of H1N1 outbreak.

Material and Methods: This was a prospective study carried out in the department of Internal Medicine at Gandhi Hospital and Medical College, Hyderabad, over a period of three years. A total of 1239 admitted patients with pneumonias including H1N1 and NonH1N1 cases were studied for patient demographics, presence of co-morbid conditions, duration of hospital stay, requirement of ventilatory support and rate of mortality.

Results: In H1N1 patients, females (60.1%) were more affected than male ones (39.9%). Most common presenting symptoms were fever (98.2%) and cough (95.3%). Comorbid conditions were present in 59 patients (20.48%) and COPD/Asthma was the commonest comorbid condition. Pregnant females with H1N1 positive had highest mortality (100%). Mechanical ventilatory support was required in 45 patients. Mortality was seen in 29 patients (10.06%). Most common affected region was lower zone of lungs with bilateral involvement

Conclusion: H1N1 pneumonia is less common than NonH1N1 pneumonias and mortality is less in former as compared to latter. Dual infection of virus and bacteria was common among ventilated patients. Pregnancy in females and COPD in males were the commonest comorbid conditions in H1N1 patients whereas it was COPD in both males and females in non H1N1 pneumonia. The commonest site of involvement in both H1N1 and non H1N1 pneumonia was lower lobe with bilateral involvement

Keywords: Non H1N1 Pneumonia, Epidemic of H1N1 Outbreak, H1N1 Mortality

in April 2009.³

The 2009 H1N1 virus contained a unique combination of gene segments that had not previously been identified in humans or animals. It appeared to be a new strain of H1N1 having viral segments from bird, swine, human flu and also from Eurasian pig flu virus which resulted in the usage of term as “swine flu”.^{4,5}

Preliminary findings in Gandhi Hospital showed mortality among non H1N1 pneumonia is more than H1N1 pneumonia. In this study at Gandhi Hospital, we compared the morbidity and mortality of Non-H1N1 pneumonia with H1N1 pneumonia during the epidemic of H1N1 influenza.

Current study compared the morbidity and mortality of Non-H1N1 pneumonia with H1N1 pneumonia during the epidemic of H1N1 outbreak.

MATERIAL AND METHODS

This was a prospective study carried out in the department of Internal Medicine at Gandhi Hospital and Medical College, Hyderabad, over a period of three years from 2009 to 2012.

Inclusion criteria

1. All adults above 18 years.
3. Laboratory confirmed positive cases and negative cases for novel influenza H1N1 by RT-PCR assay (TAQ mAN real time PCR, CDC protocol).

Exclusion criteria

1. Bacterial pneumonias

During the period 2009-2012, a total of 1239 patients who had influenza like symptoms and who required admission were admitted to Gandhi Hospital.

Demographic data such as age, gender, residential address were noted for all the patients. Complete clinical details such as presenting symptoms, past history, presence of comorbid conditions were noted. Routine investigations and radiological (Chest X ray and CT chest) assessment was done for all the patients.

INTRODUCTION

An outbreak of H1N1 influenza a virus infection was detected in Mexico with subsequent cases observed in many other countries including India in late march and early April 2009.¹

WHO raised its pandemic alert as “public health emergency of international concern” towards end of April 2009 to highest level phase 6 indicating widespread community transmissions.²

CDC confirmed the first two cases of human infection with a pandemic influenza A (H1N1) virus in the United States on

¹Senior Residents, ²Post Graduate, ³Professor, Department of Medicine, Gandhi Medical College Secunderabad, India

Corresponding author: Dr Mudumala Issac Abhilash, Post Graduate, Department of Medicine, Gandhi Medical College, Secunderabad, India

How to cite this article: NL Varun Mai, Mudumala Issac Abhilash, Narasimhulu. Comparative study of morbidity and mortality of non H1N1 pneumonia with H1N1 pneumonia in Gandhi Hospital during the epidemic of H1N1 outbreak. International Journal of Contemporary Medical Research 2017;4(9):1921-1923.

In addition, all 1239 patients underwent throat swab and nasal swab for influenza A, SW.InfA, SW. Inf H1 testing with use of real time reverse transcriptase polymerase chain reaction assay (TAQ mAN real time PCR CDC protocol). Simultaneous sputum and blood cultures were sent to rule out bacterial pneumonia.

Oseltamivir was started for all patients after the collection of throat swab was done.

The patients were observed for the requirement of mechanical ventilator support, duration of stay in hospital, presence of any comorbid conditions and mortality.

STATISTICAL ANALYSIS

All collected data was analyzed by using different statistical methods and results were obtained.

RESULTS

Out of 1239 cases admitted with influenza like illness, 288 cases were confirmed for H1N1,951 were H1N1 negative (table-1).

In H1N1 patients

Most of the patients were in the age group of 30-45 years (39.9%). Female patients (60.1%) were more affected than male ones (39.9%). Most common presenting symptom was fever (98.2%) and cough (95.3%) (table-2). Some patients also presented with diarrhea (10.06%). Comorbid conditions were present in 59 patients (20.48%). COPD/Asthma was the commonest comorbid condition and was seen in (8.7%). Pregnant females with H1N1 positive had highest mortality (100%). Average duration of stay for H1N1 cases was 9 days. Mechanical ventilatory support was required in 45 patients. Mortality was seen in 29 patients (10.06%). Most common affected region was lower zone of lungs with bilateral involvement.

In Non H1N1 cases

Most of the patients were in the age group of 20-45 years (72.9%). Female patients (55%) were almost equally affected as male ones (45%). Most common presenting symptom was fever (96%) and cough (95.3%). Comorbid conditions were present in 344 patients (36.17%). COPD/Asthma was the commonest comorbid condition (13.45%). Pregnancy was not associated with high mortality when compared to positive cases. Mechanical ventilatory support was required in 180 cases. Mortality was seen in 115 cases (12.09%). Most commonly affected site was lower zone of lungs with bilateral involvement. All the 10 pregnant patients were in their last trimester (table 3, 4).

There were 115 (39.9%) males and 173 (60.1%) females in the H1N1 group. There were 428 (45%) males and 523 (55%) females in the Non-H1N1 group (table-1).

DISCUSSION

The H1N1 flu commonly presents with variable features of fever, usually a dry type of cough headache, myalgias, arthralgias, malaise, pharyngitis, running nose. Some patients in addition may experience vomiting, diarrhea and rarely neurological symptoms.^{6,7} Similar clinical presentation was

Age (years)	H1N1	Non-H1N1
20-29	86 (29.8%)	361 (37.9%)
30-39	115 (39.9%)	333 (35%)
40-49	73 (25.3%)	191 (20%)
50-59	14 (4.8%)	66 (6.9%)
Total	288	951

Table-1: Age-wise distribution of the patients

Symptoms	H1N1	Non-H1N1
Fever	283 (98.2%)	913 (96%)
Cough(dry/with expectoration)	280 (95.3%)	907 (95.3%)
Breathlessness	248 (86.1%)	713 (74.9%)
Nausea/vomiting/diarrhea	29 (10.0%)	38 (3.9%)

Table-2: Common clinical symptoms

Co-morbid conditions	H1N1	Non-H1N1
Diabetes mellitus	12 (4.2%)	60 (6.3%)
Pregnancy	10 (3.5%)	36 (3.7%)
COPD/asthma	25 (8.7%)	128 (13.4%)
Steroid use	12 (4.2%)	92 (9.6%)
HIV/AIDS	6(2.1%)	22 (2.31%)
Heart disease	1 (0.3%)	6 (0.63%)
Any of the above condition	56 (19.4%)	344 (36.1%)

Table-3: Co-morbid conditions

	H1N1	Non-H1N1
MVS given	45	180
With co-morbid conditions	56	344
Without co-morbid conditions	232	607
Mortality in MVS (%)	25	70
Mortality with comorbid conditions	21 (72.4%)	74 (64.3%)
Mortality without comorbid conditions	8(27.6%)	41 (35.6%)
Mortality (%)	29 (10.0%)	115 (12.0%)
Total	288	951

MVS- Mechanical ventilator support
Table-4: Mortality in H1N1 and Non-H1N1 cases

seen in most of the cases in our study. The extremes of age like children less than five years and adults above 65 years are more susceptible. In our study, most of the patients were young adults. Pregnancy especially infection during the last trimester,⁸ is associated with many complications and has high mortality. In our study also all the ten pregnant women were in variable stages of third trimester and all ten patients had mortality. Presence of any underlying medical conditions or comorbidities such as asthma, diabetes, obesity, heart disease, or depressed immunity makes individuals more vulnerable to this disease and also has higher mortality.⁹ CDC has reported that more than 70% of hospitalizations in the United States in patients with H1N1 infection have been in people with some underlying comorbid condition.¹⁰ In our study also a high mortality of 72% was seen in those with comorbid conditions as compared to a low mortality of 27% in those patients who did not have any comorbid condition and who were apparently well before contracting the H1N1 virus.

Mechanical ventilatory support is required in some of the patients who are previously healthy but deteriorate rapidly with the onset of symptoms. This is believed to be due to an exaggerated immune response in these patients.¹¹

Pulmonary complications, respiratory failure, secondary bacterial pneumonias are common complications of H1N1 infection. Cardiac and neuromuscular complications such as fulminant myocarditis and pulmonary embolism are relatively rare but are nonetheless reported.¹² The virus is less lethal than previous pandemic strains and kills about 0.01–0.03% infected people.

Earlier in the United Kingdom, vaccine priority was given to only people over six months old who were clinically at risk for seasonal flu, pregnant women people with compromised immunity.¹³ In February 2010, the CDC's Advisory Committee on Immunization Practices voted for "universal" flu vaccination in the United States and recommended the vaccine for all people over six months of age.¹⁴

Antivirals (oseltamivir or zanamivir) are recommended for at-risk groups with the beginning of flu symptoms. The at-risk groups include pregnant women, just delivered women, children under two years old, and people with underlying conditions such as respiratory problems.¹⁵ Previously healthy individuals but having deteriorating symptoms also require antiviral treatment. People who have already developed pneumonia should receive both antivirals and antibiotics, as in some cases there is a superimposed secondary bacterial pneumonia.¹⁶ Antivirals are most useful if given within 48 hours of the start of symptoms and may improve outcomes in hospitalised patients.¹⁵

CONCLUSION

Among cases presenting with pneumonias that require admission, the cases of H1N1 were less compared to NonH1N1. Among cases presenting with pneumonias that require admission deaths among H1N1 are also less compared to nonH1N1 pneumonia. There is no significant death difference between H1N1 and non H1N1 ($P > 0.05$).

Dual infection of virus and bacteria was common among ventilated patients. Pregnancy in females and COPD in males were the commonest comorbid conditions in H1N1 patients whereas it was COPD in both males and females in non H1N1 pneumonia. The commonest site of involvement in both H1N1 and non H1N1 pneumonia was lower lobe with bilateral involvement. Further studies are needed to better understand the etiopathogenesis of viral Community acquired pneumonia. Furthermore, regional differences in the cases of pneumonia should be investigated in particular to obtain more data from developing countries.

REFERENCES

1. McNeil, Jr., Donald G. In new theory, swine flu started in Asia, not in Mexico. June 2009 The New York Times.
2. Chan M. WHO-Swine Influenza. Statement by WHO Director-General April 2009.
3. CDC, Centres for disease control and prevention. 2009 H1N1 Flu Update.
4. Trifonov V, Khiabani H, Rabadan R. Geographic

Dependence, Surveillance, and Origins of the 2009 Influenza A (H1N1) Virus. *New England Journal of Medicine* 2009;361: 115–119

5. Helleman C. Swine flu not stoppable. *World Health Organization* 2009.
6. Schuchat A. CDC briefing on investigations of human cases of H1N1 flu. Centers for Disease Controls and Prevention (CDC). July 2009.
7. Interim Guidance for 2009 H1N1 Flu (Swine Flu): Taking Care of a Sick Person in Your Home. Centers for Disease Controls and Prevention (CDC). August 2009.
8. Picard A. Reader questions on H1N1 answered. *The globe and mail*. Toronto, Canada. November 2009.
9. Hartocollis A. Underlying conditions may add to flu worries. *The New York Times*. April 2013.
10. Whalen J. Flu pandemic spurs queries about vaccine. *The wall street journal*. June 2009.
11. Over-reactive immune system kills young adults during pandemic flu. *PhysOrg.com*. 5 2010. Vanderbilt University Medical Center.
12. Rothberg MB, Haessler SD. Complications of seasonal and pandemic influenza. *Critical Care Medicine* 2010; 38: 91–7.
13. Swine flu latest from the NHS. *NHS Choices*. NHS Knowledge Service September 2009.
14. Vaccine selection for the 2010-2011 influenza season. U.S. Centers for Disease Controls and Prevention (CDC). October 2010.
15. Updated interim recommendations for the use of antiviral medications in the treatment and prevention of influenza for the 2009-2010 season. Centers for Disease Controls and Prevention (CDC). September 2009.
16. Gregory H, Nikki S. Transcript of virtual press conference. Global influenza programme, WHO, November 2009.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 27-08-2017; **Accepted:** 30-09-2017; **Published:** 08-10-2017